CalPERS Investment Committee

Asset Allocation Workshop Preview and Risk Budgeting Proposal

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The Golden Rule of Asset Allocation

90%-plus of the variation between total fund returns results from asset allocation.

The Range of Allocations to Each Asset Class for State Systems

	Lowest (%)	Median (%)	Highest (%)
U.S. Equity	0.0 %	43.1 %	69.1 %
Non-U.S. Equity	0.0	18.0	56.9
Private Equity	0.0	3.3	16.8
Real Estate	0.0	5.0	14.2
U.S. Bonds	12.0	25.7	97.4
Non-U.S Bonds	0.0	0.0	9.4
Hedge Funds	0.0	0.0	10.4
Other	0.0	1.0	27.4
Expected Returns	**5.0 %**	**7.7 %**	**8.7 %**

Implications of The Golden Rule of Asset Allocation

- **Nothing else the Investment Committee does will have the impact of this single decision.**

- **Major changes may take time to implement**
  - **Texas Teachers recently increased alternatives from 3% to 30%. Actual investment cannot happen overnight.**

- **Individual manager selection and performance is a relatively trivial component of Total Fund Return.**
  - **A manager with $500MM and 1.00% annual outperformance only impacts total fund returns by 0.002%**

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Two Kinds of Risk to Control

- **Total Fund "Benchmark" Risk**
  - **Can be measured as "Value at Risk" or "Standard Deviation"**
  - **Results from Asset Allocation workshop or interim additions of new asset classes**

Change in Average Asset Allocation for State Pension Plans

	2001	2006	Change
Equity			
US Equity	44.8 %	42.3 %	-2.5 %
Non-US Equity	13.5	17.1	3.6
Real Estate	3.4	4.8	1.4
Private Equity	3.6	4.4	0.8
Equity Subtotal	65.3	68.7	3.4
Debt			
US Bonds	30.7	27.2	-3.5
Non-US Bonds	1.8	0.9	-0.9
Other	2.2	3.2	1.0
Debt Subtotal	34.7	31.3	-3.4
Return *	7.6	7.7	0.1
Risk *	11.3	11.9	0.6

*** Calculated based on Wilshire's annually published return, risk, and correlation assumptions.**

Two Kinds of Risk to Control

- **Risk versus Total Fund Benchmark**
  - **Measured as "Performance at Risk" or "Tracking Error"**
  - **Increases with any shift from Passive to Active management**
  - **Provides for only opportunities to "Outperform"**
    - **But, no guarantee of outperformance!**
  - **Active management fees account for 98.5% of total costs of investment office**
  - **Most clients we work with use a risk budget in the 1% to 2% range**
  - **Staff discussed a hypothetical budget of 1.00% at the October meeting**
    - **Actual Tracking Error has been:**
      - ✓ **3 Years = 0.60%**
      - ✓ **5 Years = 0.70%**
      - ✓ **10 Years = 0.85%**
    - **An excess risk budget in the range of 1% to 2% would be consistent with both industry practice and CalPERS' historical risk levels**

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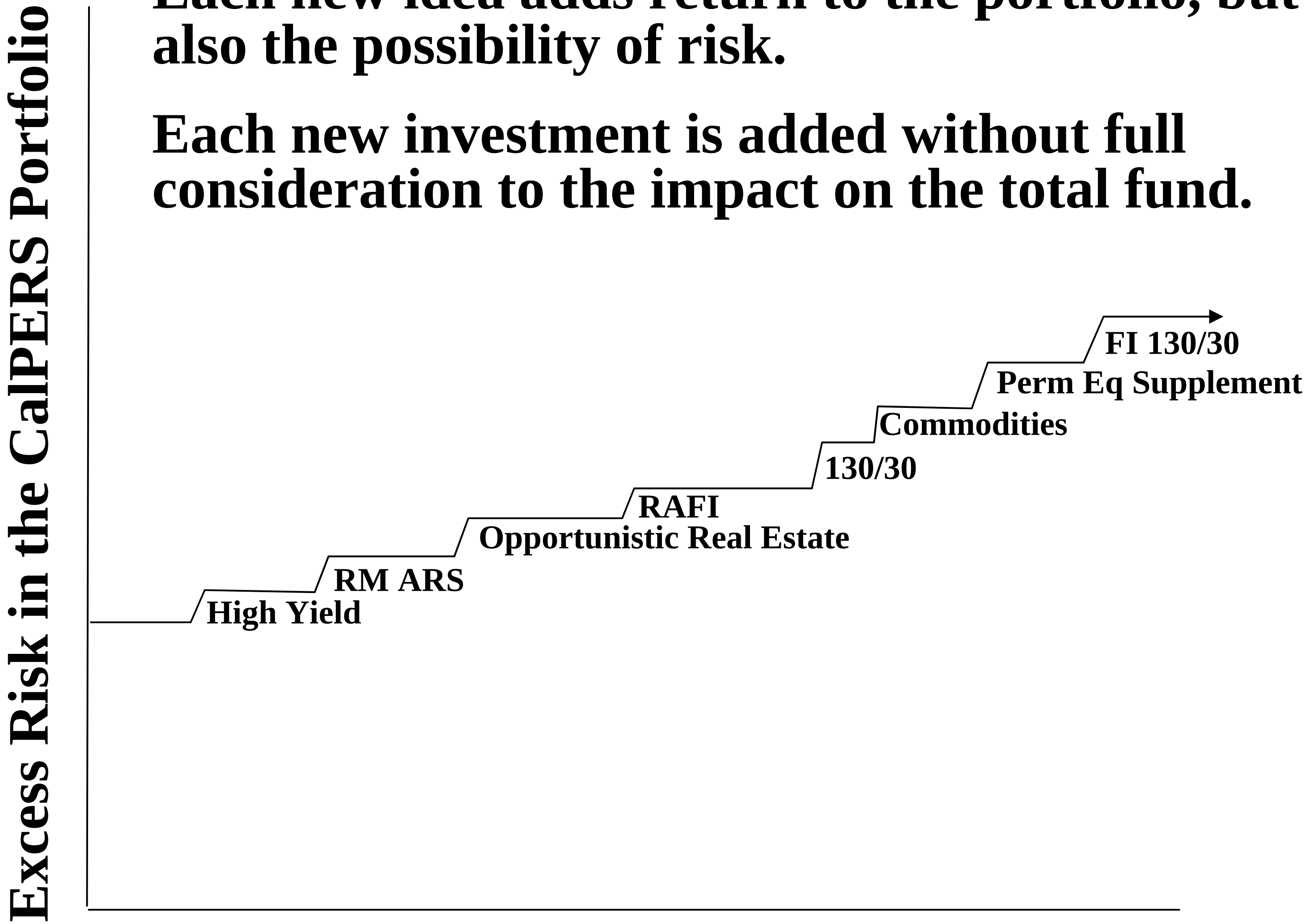
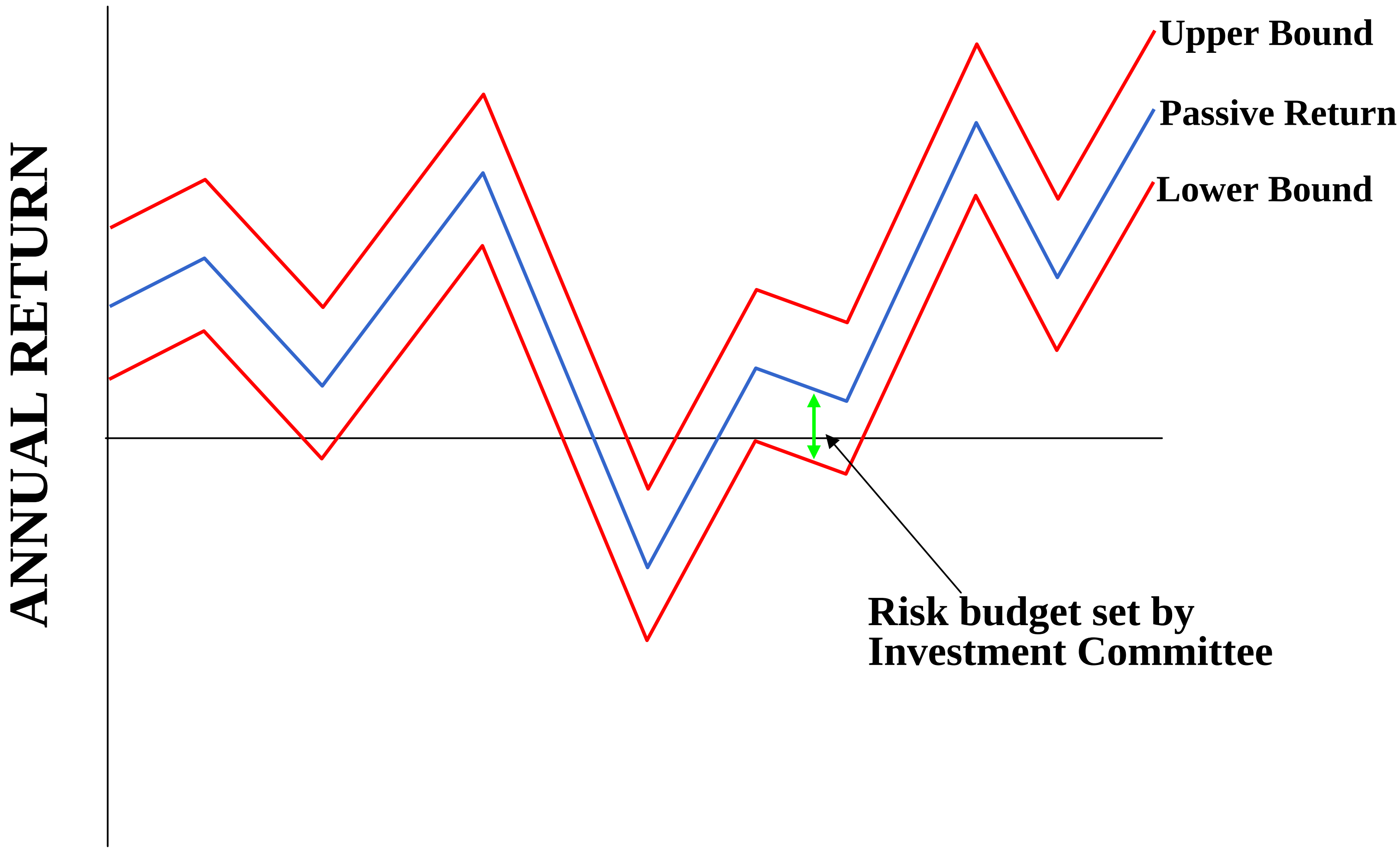
The Need for a Risk Budget

Each new idea adds return to the portfolio, but also the possibility of risk.

Each new investment is added without full consideration to the impact on the total fund.



IC Sets Maximum Risk Level



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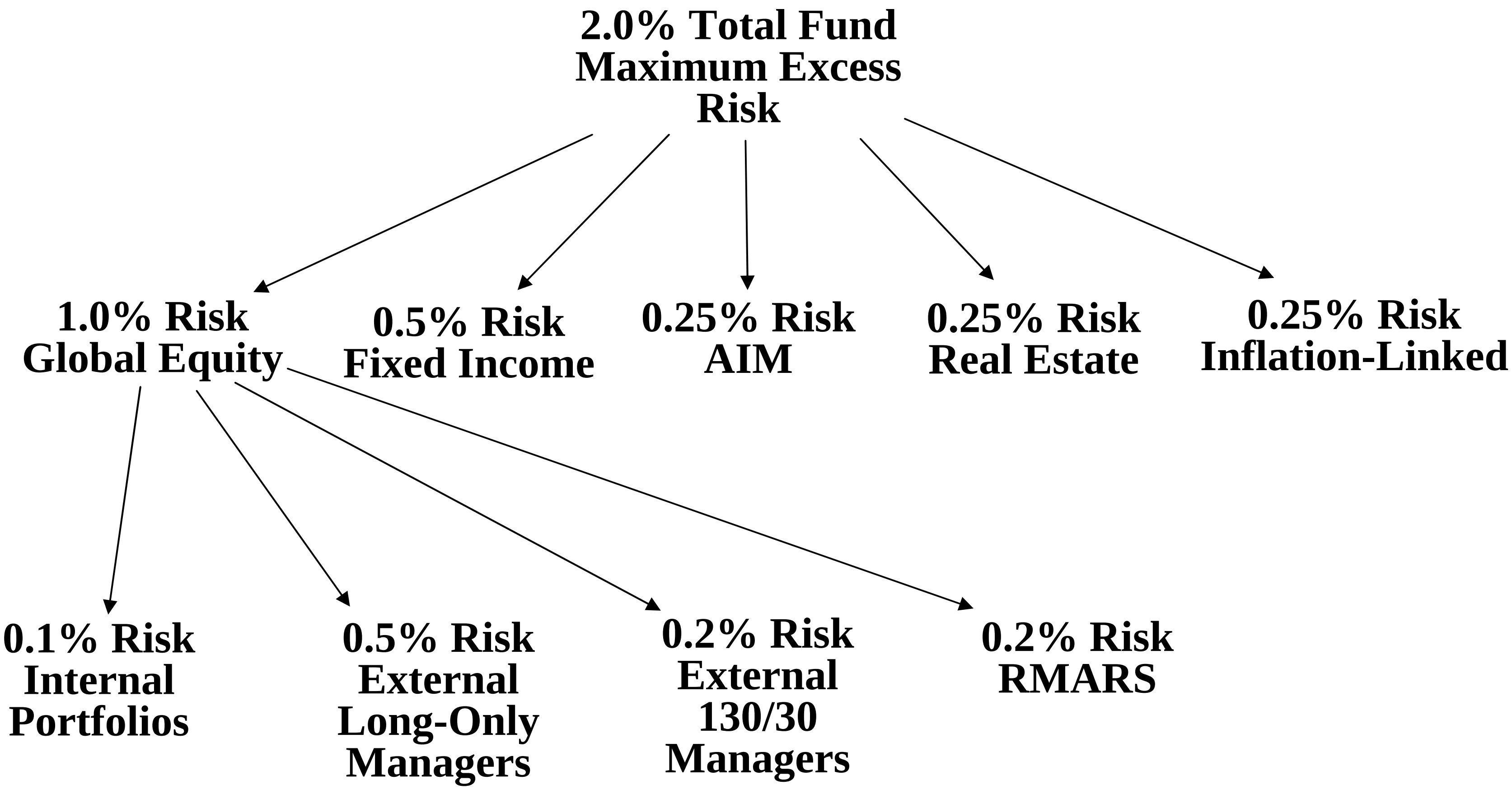
IC / CIO Allocates Risk to SIOs

2.0% Total Fund Maximum Excess Risk

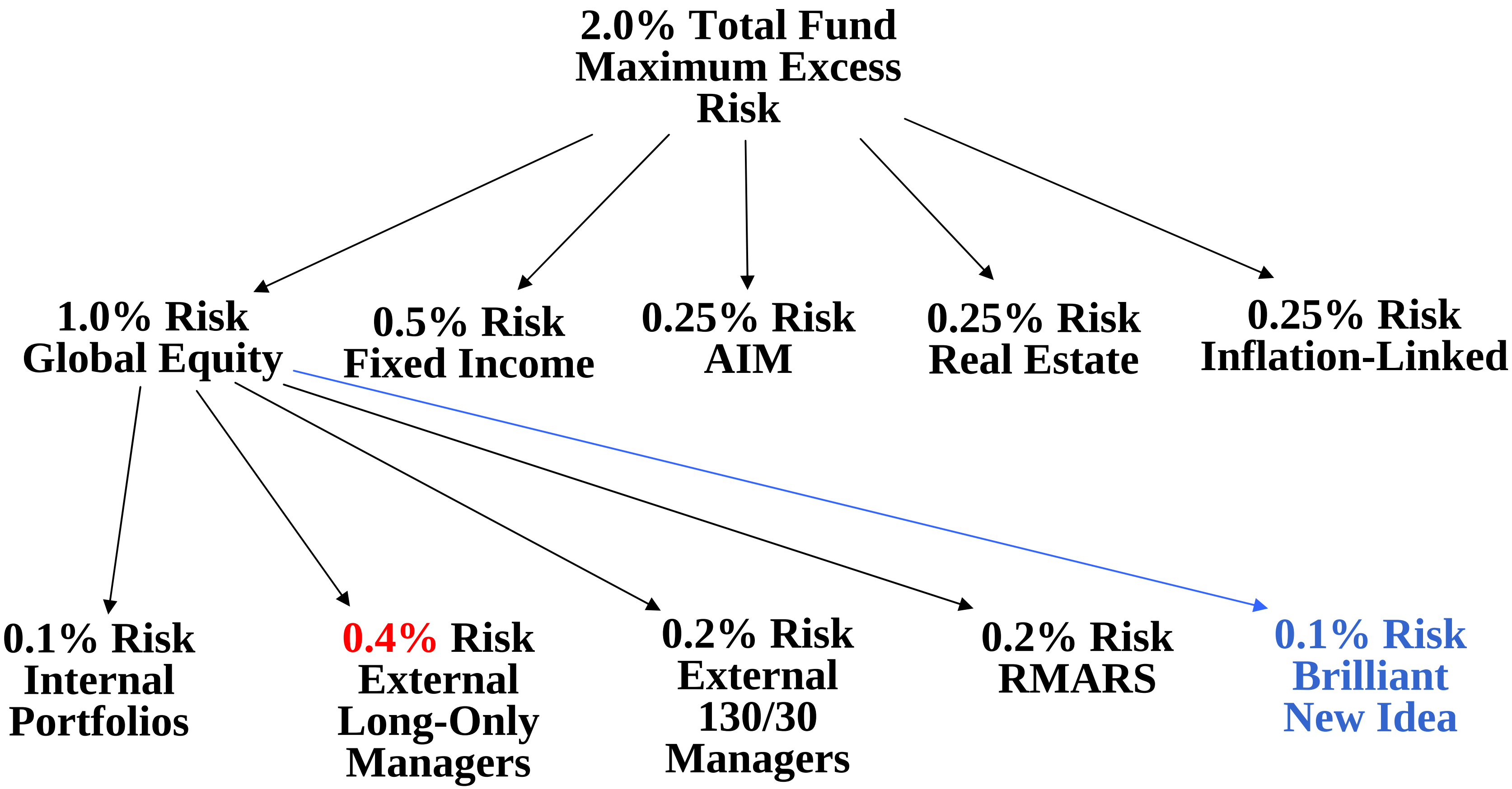
- **1.0% Risk** Global Equity
- **0.5% Risk** Fixed Income
- **0.25% Risk** AIM
- **0.25% Risk** Real Estate
- **0.25% Risk** Inflation-Linked

Risk allocated to asset classes may total more than nominal risk budget due to diversification advantages. (Risk is not necessarily additive.)

CIO / SIOs Allocate Risk to Investment Classes



New Ideas Replace Existing Users of Risk Budget



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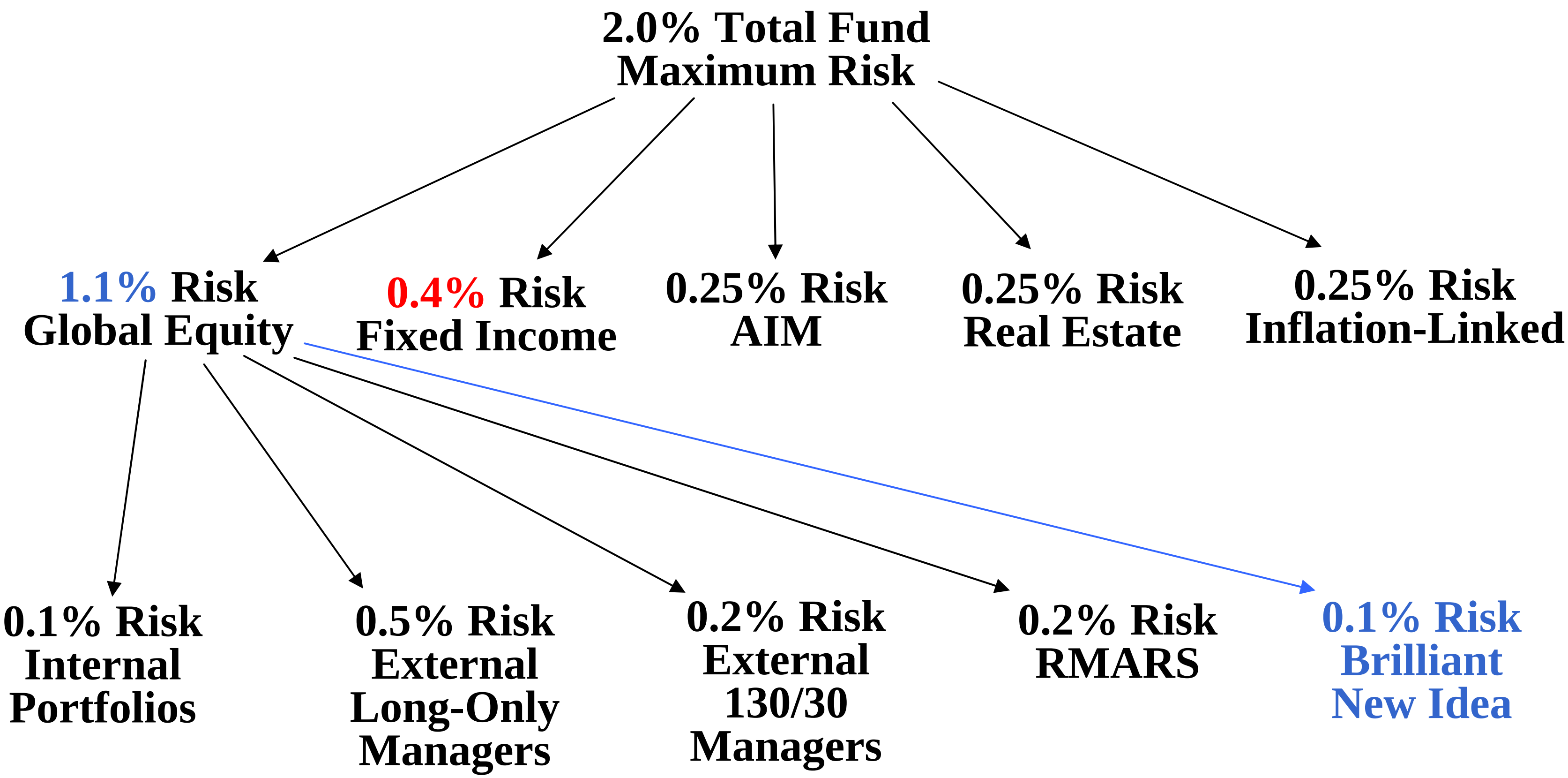
New Ideas Replace Existing Users of Risk Budget



Since all of CalPERS has a single risk budget, a more efficient user of risk in one asset class may replace a less-efficient user elsewhere.

Risk Budgeting

- **Wilshire recommends that the Investment Committee set a maximum risk budget (Performance at Risk).**
- **The CIO allocates risk to each SIO.**
- **New ideas (sources of risk) from the CIO, SIOs, other Staff, managers, or consultants must displace existing ideas since the total risk cannot increase.**
- **Benefits?**
  - **Will require that only the best ideas make it into the portfolio (there is not space for every idea)**
  - **Will cap the steady escalation of total risk experienced over the last few years.**
  - **Will require all Staff to think Globally. Everyone wins if Domestic Equity gives up part of its risk budget for a better idea in AIM.**
  - **Will result in a constantly increasing level of return / risk efficiency in the portfolio.**

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Risk Budgeting

- **Cons?**
  - **May require changes to Incentive Compensation to reward SIOs for relinquishing their risk budgets to other asset classes**
  - **Can result in substantial shifts in resources as new ideas displace old ideas**
  - **Will require highly accurate calculations of the risk of each investment program**
    - **May need more Staff, software, vendors, etc.**